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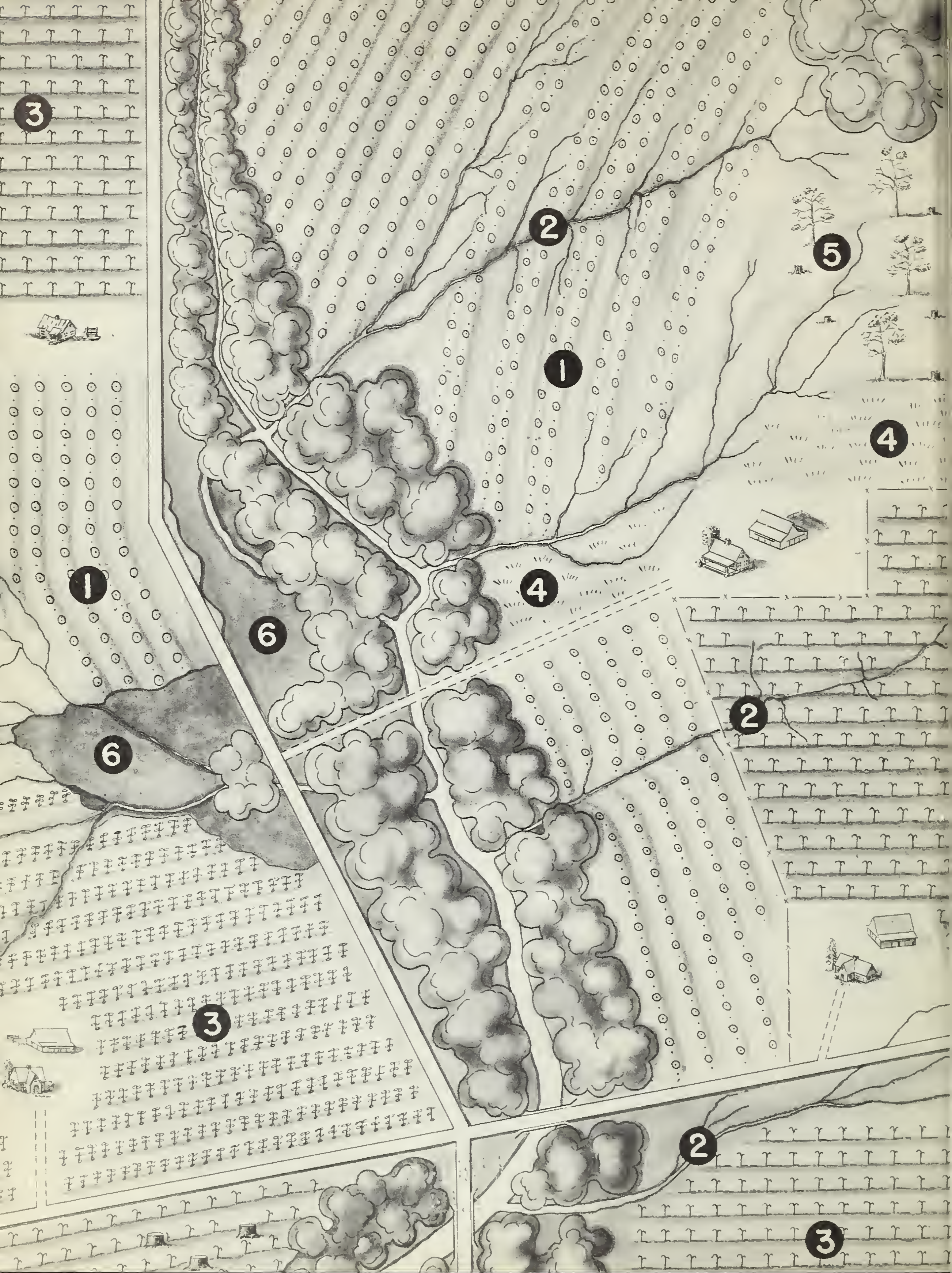
# NEW LANDMARKS OF SOIL CONSERVATION

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOUTHERN STATES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# TOWARD SOIL CONSERVATION

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The wealth of this Nation is rooted in the soil. Thirty million people earn their living directly from farms and ranches. The remaining 100 million Americans depend upon the soil for most of their food, much of their clothing, and many other necessities.

Today the soil of this Nation is being wasted away. Erosion is steadily washing good soil out of the fields and pastures, into the streams, down the rivers, and to the sea.

The pictorial map on the opposite page, based upon a typical farming area of the Southern States, shows the land in patterns of soil depletion and waste. Destruction of the land is caused chiefly by square farming—plowing uphill and downhill in straight rows despite the curving topography—which produces [1]

❶ SHEET EROSION, by which the top layer of soil is skimmed off the land.

❷ GULLIES, a more obvious form of erosion, that gouge out the sides of sloping fields.

Other influences that deplete the soil include

❸ ONE-CROP FARMING, without proper rotations, which weakens the soil and brings on erosion.

❹ OVERGRAZING OF PASTURES, which strips the land of soil-binding grasses, and

❺ ABUSE OF WOODLANDS, which destroys Nature's best protective cover for the soil.

Together, these processes contribute to—

❻ FLOODING of bottom lands, by causing an excessive and rapid run-off of rain water.

The American people have awakened to this stealthy pillage of their land, and on millions of acres they are now supplanting waste with conservation. The following pages show how the individual problems of soil depletion are being solved and describe the new patterns of soil conservation that are being etched upon the land.

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[1] Numbers refer to map, opposite.

# SHEET EROSION GOES UNNOTICED

Sheet erosion often goes unnoticed, yet its damage can be found on sloping land our country over. Down millions of tiny rills, rains skim the richer surface layer of soil from bare and clean-tilled fields and from pastures where grass is thin.

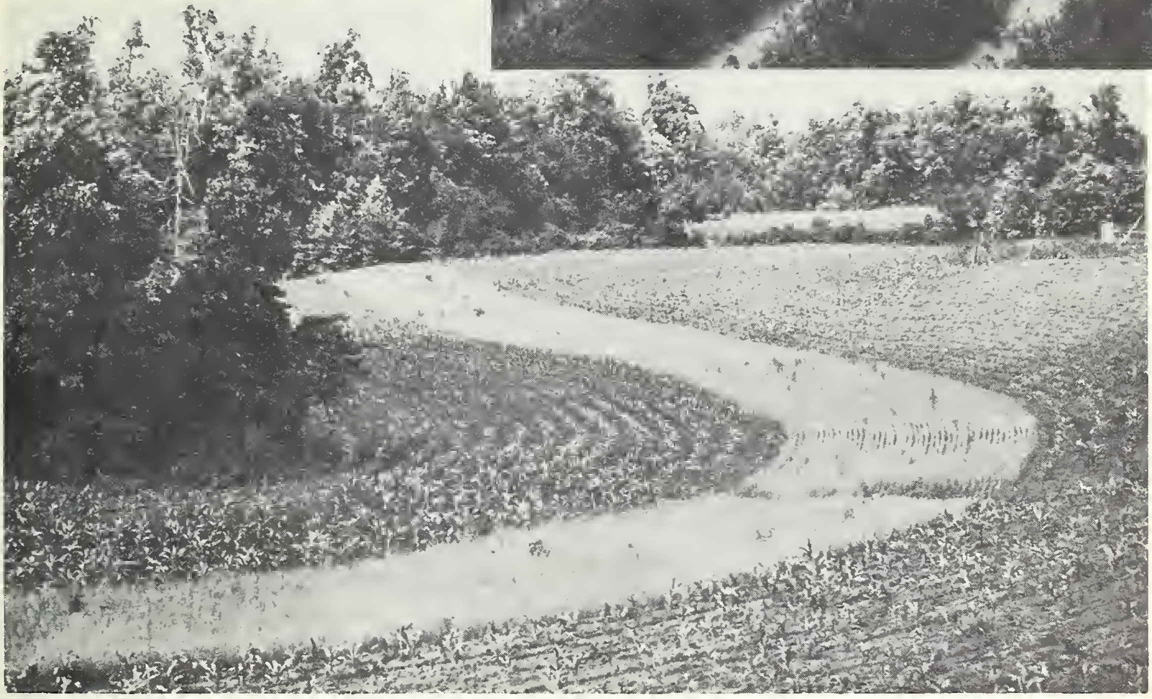
It may take only a short time for sheet erosion to remove the thin layer of topsoil from a field; but it has taken Nature thousands of years to build the few precious inches of this film of life.

Sheet erosion reduces soil fertility and encourages gullies, gradually decreasing crop yields and increasing production costs.

# FARMING "ON THE LEVEL"

Farming sloping land "on the level" instead of uphill and downhill retards erosion on cultivated fields. Each row and furrow along the contour helps to hold the rain water where it falls, permitting it to seep into the soil or to flow away slowly and safely.

Small grains—oats, rye, barley, and wheat—and green-manure cover crops, such as vetch, Austrian Winter peas, bur-clover, crimson clover, cereal rye, and ryegrass, protect fields from sheet erosion in winter, when the soil would otherwise be bare.

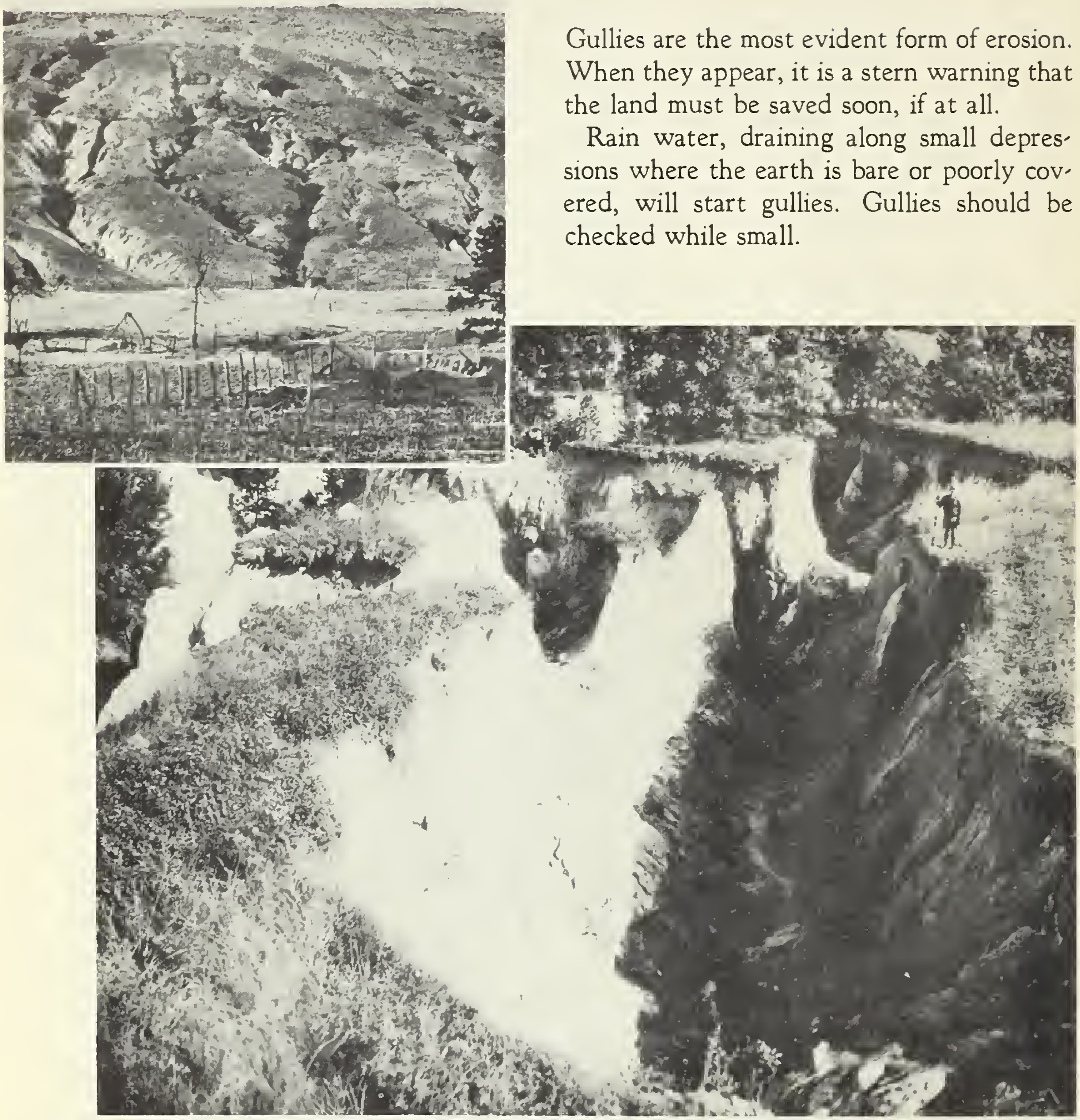


Frequently row crops, such as cotton, tobacco, corn, potatoes, and soybeans, can safely be grown on moderately sloping lands if planted in contour strips alternated with strips of close-growing crops that protect the soil from washing.

# GULLIES—A STERN WARNING

Gullies are the most evident form of erosion. When they appear, it is a stern warning that the land must be saved soon, if at all.

Rain water, draining along small depressions where the earth is bare or poorly covered, will start gullies. Gullies should be checked while small.



If neglected, gullies grow rapidly, forming descents down which valuable soil is carried. Through them, water needed for the growth of crops runs off. Fields torn by these ragged gashes are difficult to cultivate and if not properly treated must eventually be abandoned.

# MAKING THE WATER WALK

Make the water walk—and pave the drainageways with vegetation. These are the answers to the threat of gullies.

Terraces retard the downhill flow of rain water, letting more of it seep into the soil and leading the surplus into safe channels. Diversion ditches keep the water out of gullies that are dangerously large and enable them to heal.

Broad meadow strips and vegetated waterways are safe drainageways through cultivated fields. While protecting the land from erosion, meadow strips also produce feed and hay.

Often, safe channels in which to lead off surplus water from fields can be made by healing old gullies. Their steep sides can be sloped and planted to Bermuda grass, kudzu, shrubs, or trees that will hold the soil in place. Even deep canyon gullies can be walled with the kudzu vine.

## ONE-CROP FARMING ROBS THE SOIL

Cash crops—cotton, tobacco, corn, sorghums, and small grains—remove plant food from the soil. Such crops, if grown continuously on the same field, soon will exhaust the soil fertility. Soil so impoverished is highly susceptible to erosion: Loss of organic matter reduces the capacity of the soil to absorb and hold rainfall and leads to soil washing. Abandonment frequently follows.

## REPLENISHING THE SOIL WITH ORGANIC MATTER

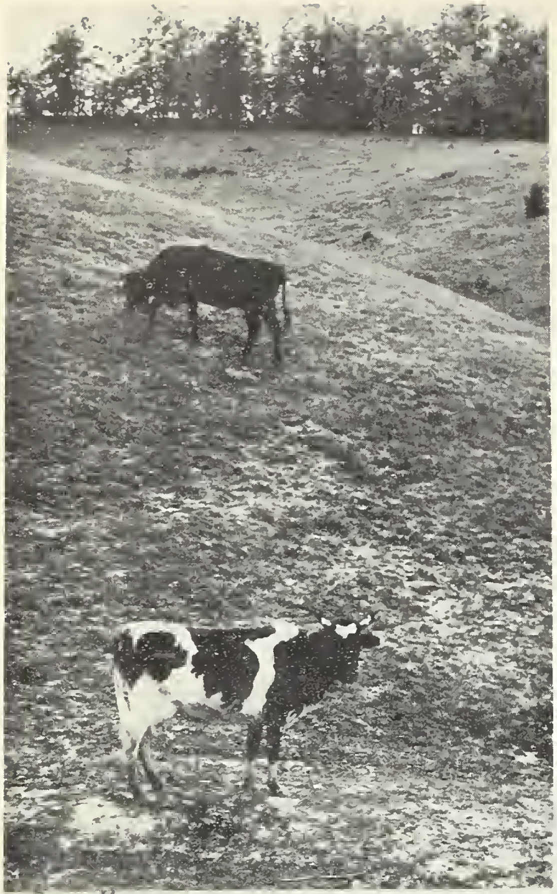
Plant mulches and green-manure cover crops such as Hubam clover, sweetclover, cowpeas, soybeans, and annual lespedezas keep the soil in good physical condition and maintain soil fertility by replenishing organic matter. Legumes also add nitrogen to the soil.

# CROP ROTATION AND STRIP FARMING

Crop rotation is an important means of protecting soil. Organic matter in the soil is increased when grasses and legumes are alternated with cotton or corn. Rotations are easily worked into strip farming as a dual weapon against erosion.

Annual legumes, such as Kobe, common, or Korean lespedeza, bur-clover, crimson clover, and Crotalaria are excellent crops to include in rotations for soil improvement and protection. Many of these provide valuable grazing for livestock. On steeper lands, which should remain under cover most of the time, the perennial legumes such as kudzu and sericea lespedeza are better adapted.

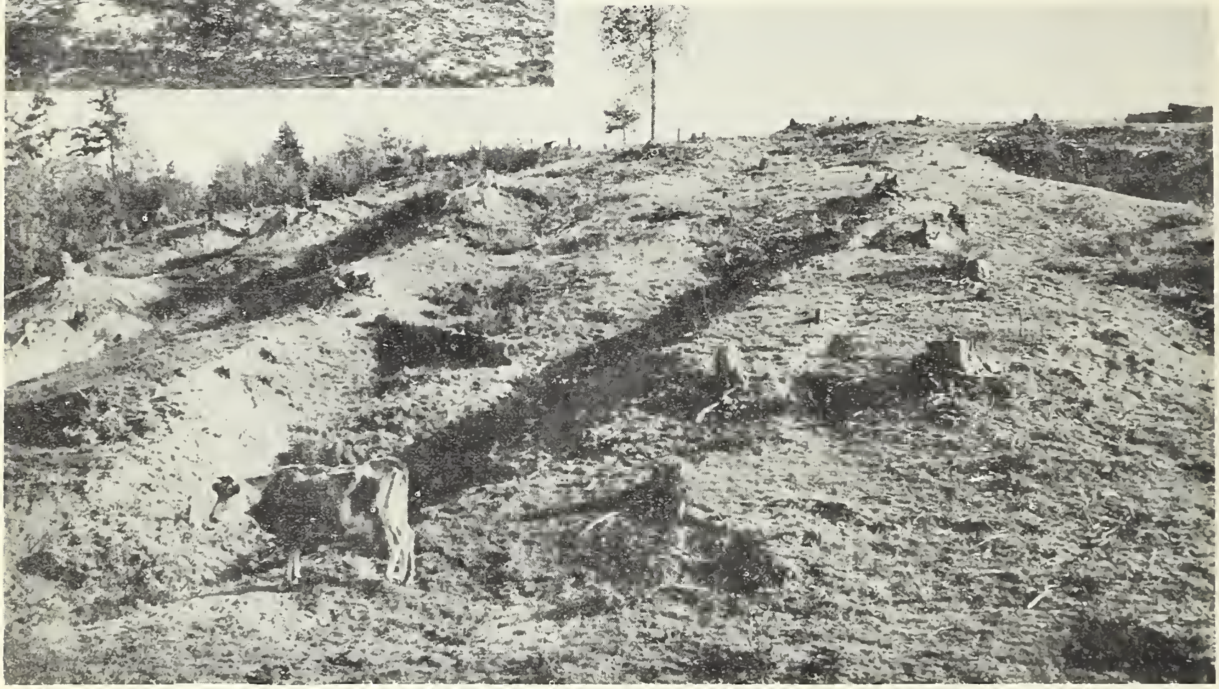
Grasses and small grains are also important crops for southern rotations.



# EROSION AND HUNGRY LIVESTOCK

Abandoned, worn-out, and eroding cropland, left to such plants as broomsedge, weeds, and thistles does not make good pasture. Sparse, weak grass on worn-out cropland and overgrazed pastures fails to feed livestock adequately and offers little protection against erosion.

On such pastures, any good forage plants will be cropped so closely as to make little growth. Even on good pastures if grazed too heavily or too long, the grass will not be able to make a proper growth. Small top growth restricts root growth, reducing the vigor of plants. When grasses go into winter in that condition, they do not make a strong start in the spring, and the whole pasture is depleted.



First evidence of deterioration on overgrazed pastures is the barren spots where sheet erosion is in progress. Then gullies form and more soil is broken loose and carried downhill.

# GOOD PASTURES CONSERVE SOIL

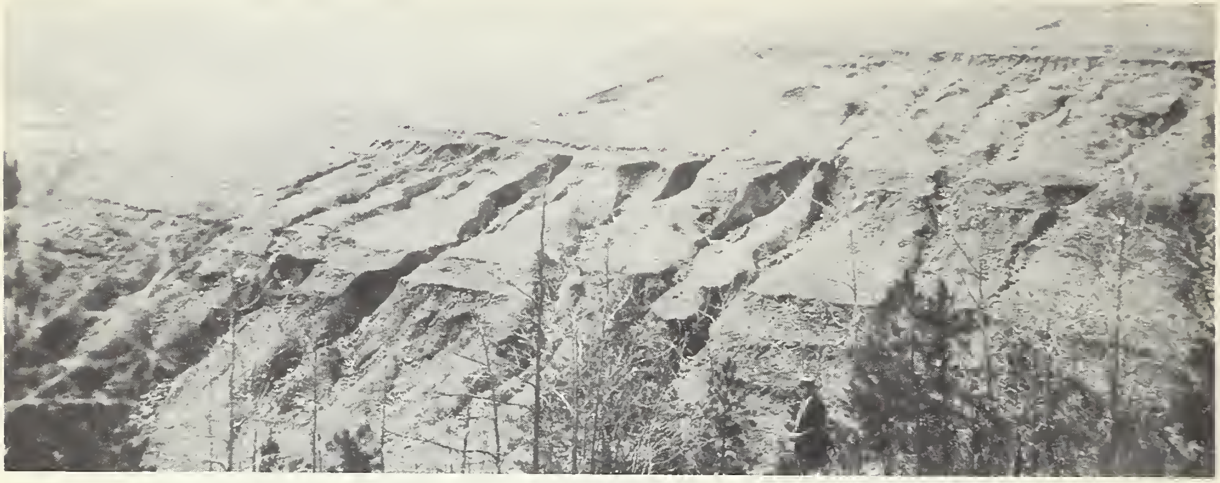
Pastures respond to good treatment as surely as do croplands. Thick stands of nutritious grasses and legumes will produce more and better livestock and are among the best means of conserving and building up the soil.

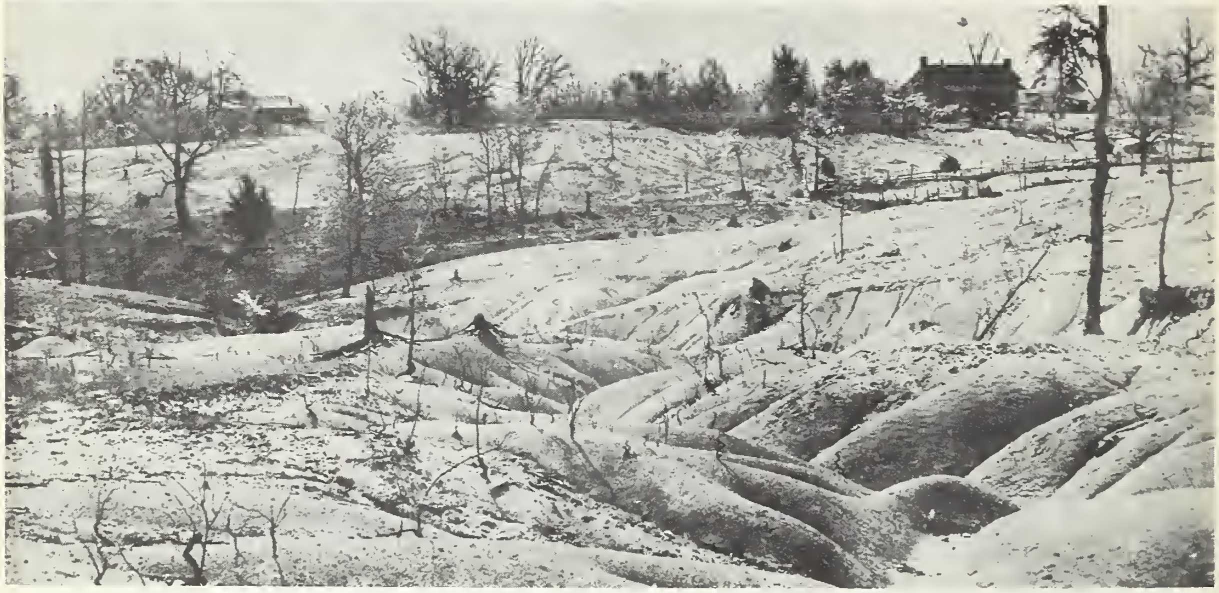
Pastures of such grasses as Bermuda, Dallis, bluegrass, and little bluestem where adapted, will produce well if protected against overgrazing and burning. Liming, fertilizing, and seeding help to develop better stands of pasture grasses. Even on worn-out and abandoned cropland, good pastures can be developed by building up the soil, preparing a good seedbed, and providing contour furrows to check run-off.

Good pasture management demands first of all that overgrazing be avoided. Mowing to keep down weeds is another important practice in managing southern pastures.

In order to be able to keep livestock on pasture for as much of the year as possible, farms should maintain more than one kind of pasture. In this way both summer and winter grasses, together with legumes such as clovers, lespedezas, and kudzu, can be made available.

# TREES CAN SAVE THIS LAND





Steep slopes and badly gutted soils need trees to check the devastation. Woodlands are the best protection for the soil that Nature has devised.

Fire, greatest enemy of the forest, is also a destroyer of the soil. When trees are killed and the ground litter reduced to ashes, the value of woodlands as a soil cover is gone. Sheet erosion and gullies set in on the burned and barren land.

Grazing also greatly decreases the value of woodlands as a protector of the soil. Livestock kill the young growth and trample the ground litter into a hard mat. Grazed woodlands generally produce both poor timber and poor pasture.

# FARM FORESTS FOR INCOME AND SOIL PROTECTION

Under good management farm forests provide timber, fence posts, cordwood, pulpwood, and other useful products for the farm or for sale. Not many farmers have realized the value of their farmwoods.

Simple protection against fire and grazing and intelligent cutting improve the farmwoods. Yields of timber can be increased while the soil is safely covered.

Tree plantings on badly eroded lands can restore waste areas to usefulness and stop soil washing.

There are trees to fit every soil and variety of climate. In the South, pines are the most desirable commercially. Locusts are among the best trees for erosion control and provide excellent fence posts. Locust posts have been found in still serviceable condition after more than a century of use.

# WILDLIFE IN PASSAGE

Man, in his zeal to clear forest and shrub areas, drains swamps and plows grasslands, unknowingly destroying the food supplies, escape cover, and breeding places of wildlife. Clear cultivation and the burning of grass and wooded lands, fence rows, and field borders added to the desolation. In many areas, hunting has been less damaging to wild birds and other animals than has the removal of the native environment in which they flourished.

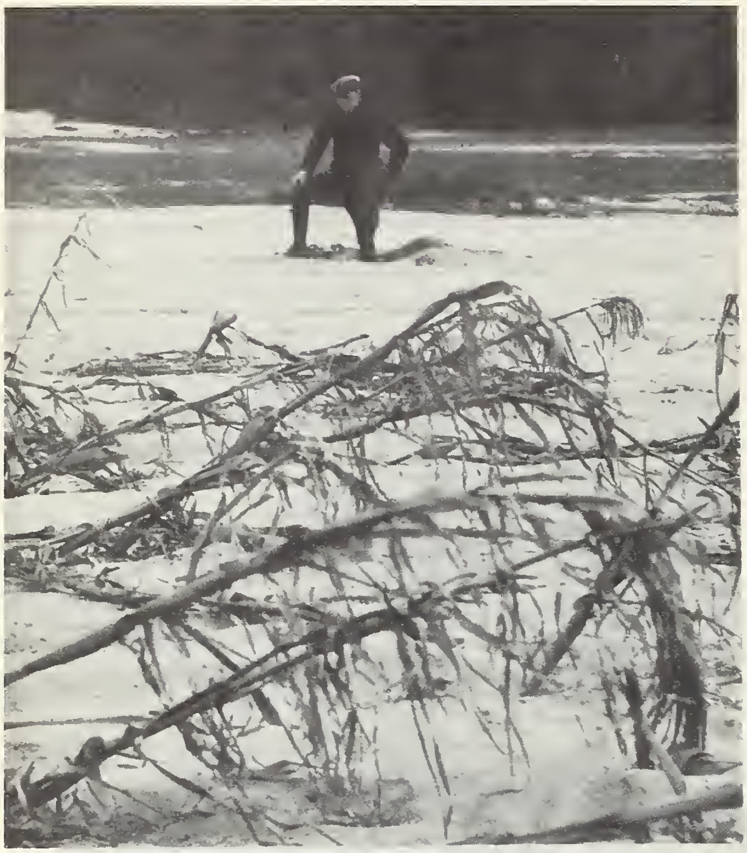
Today, the heath hen, the passenger pigeon, and other species have been driven from the earth; other desirable birds and animals are threatened with extinction. Upsetting Nature's balance, this destruction of wild life has deprived farmers of protection from insect pests and of other benefits that birds and animals give.

# RESTORING WILDLIFE TO THE LAND

Wildlife has its place in the patterns of well-used land: For its own sake, for insect and rodent control, and for hunting and fishing. In former gullies, food-bearing grasses and shrubs give shelter and sustenance to birds and small animals. In field borders, along stream banks, and at the edge of the woods grow plants that hold the soil and encourage wildlife.

Ponds and small reservoirs built for water conservation give refuge to waterfowl, and clearer streams, free of silt, create a better environment for fish.

# FLOOD—THE DESTROYER



Where storm waters race unchecked down barren slopes, floods develop more often and more seriously than is necessary. Sheet erosion and gullies feed the destructive force of swollen streams.

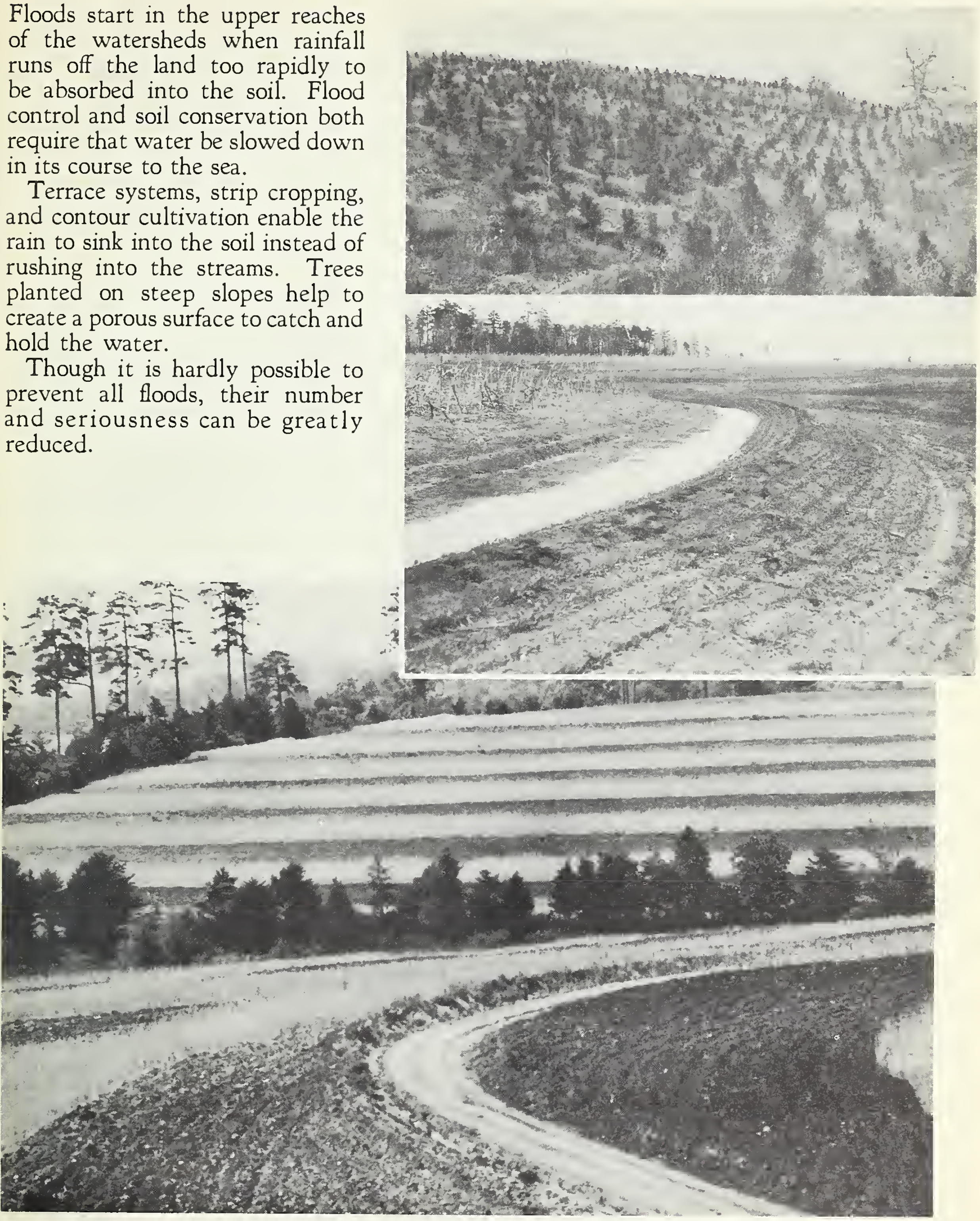
Floods cover good agricultural bottom land with silt, sharp sterile sand, rocks, and debris, ruining them or making reclamation difficult and expensive. Depositing the priceless topsoil of misused land, floods silt up waterways and harbors and reduce the storage capacity of lakes and reservoirs. They inundate homes, towns, and cities, and destroy highways and railroads. Floods cost this country approximately 100 million dollars every year.

# CONSERVATION PRACTICES REDUCE FLOOD DANGERS

Floods start in the upper reaches of the watersheds when rainfall runs off the land too rapidly to be absorbed into the soil. Flood control and soil conservation both require that water be slowed down in its course to the sea.

Terrace systems, strip cropping, and contour cultivation enable the rain to sink into the soil instead of rushing into the streams. Trees planted on steep slopes help to create a porous surface to catch and hold the water.

Though it is hardly possible to prevent all floods, their number and seriousness can be greatly reduced.



# LAND TOO POOR FOR FARMING

Some areas of land have already become impossible to farm successfully, while other lands have been settled that were never suited to cultivation. On these "submarginal" acres farmers fail to make a living. Erosion and other forms of land depletion go on unchecked, undermining the business and social life as well as the agriculture of the area.

# NEW FORESTS AND PASTURES

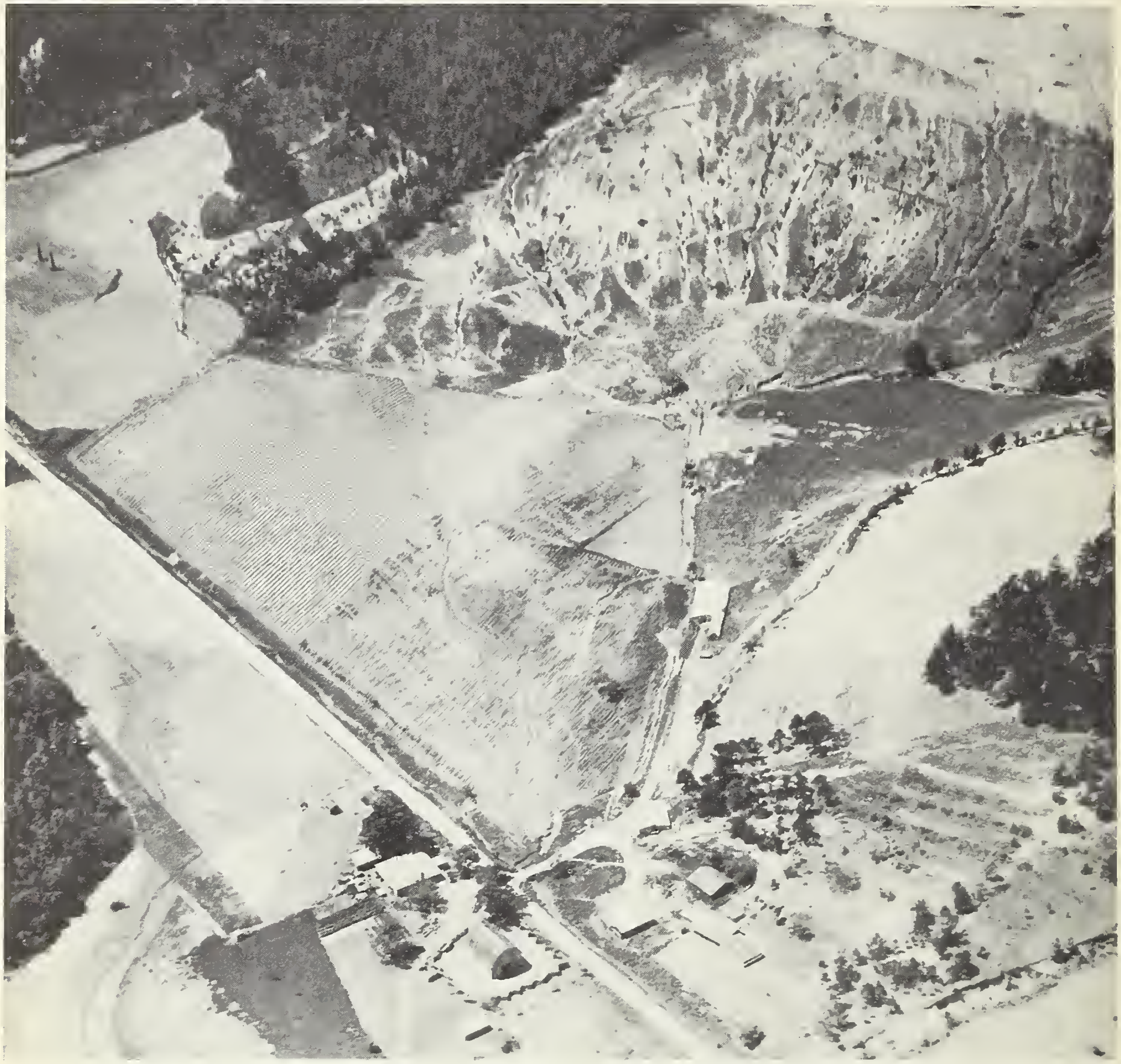
In areas where submarginal farms are numerous, the Government is buying land and developing it as forest or pasture. Families selling their farms are helped to establish better homes elsewhere; those who remain enjoy new opportunities to make a living by grazing livestock on the pastures or working in the forest.

Restored to usefulness by trees or grass, the former waste lands also provide cover and food for wildlife and create new opportunities for public recreation.

One quarter of the income received from these purchased lands by the Federal Government is turned over to local taxing authorities in place of the taxes that were formerly levied against the land.

# NOT A ONE-MAN JOB

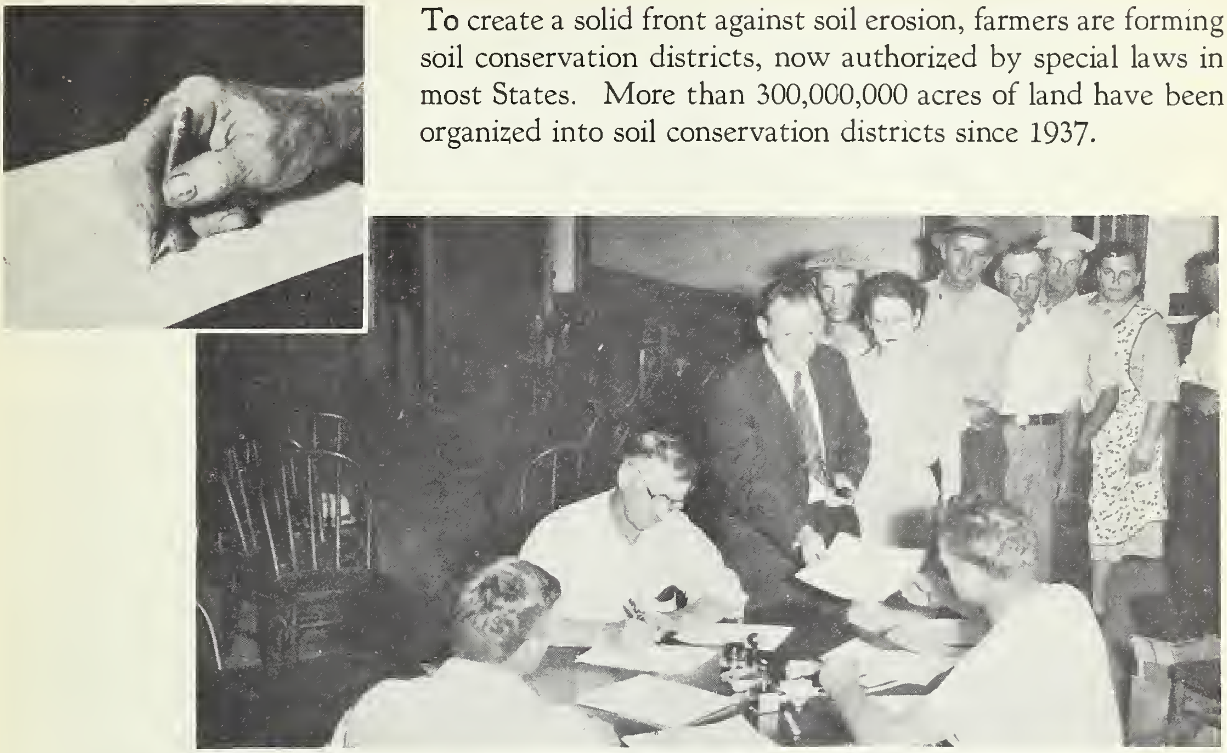
Erosion is often too big a problem for one man to tackle alone. Running water and washing soil pay no heed to property lines. One man's attempts to conserve his soil and water may be blocked by a neighbor's acts—or by the neighbor's failure to act.



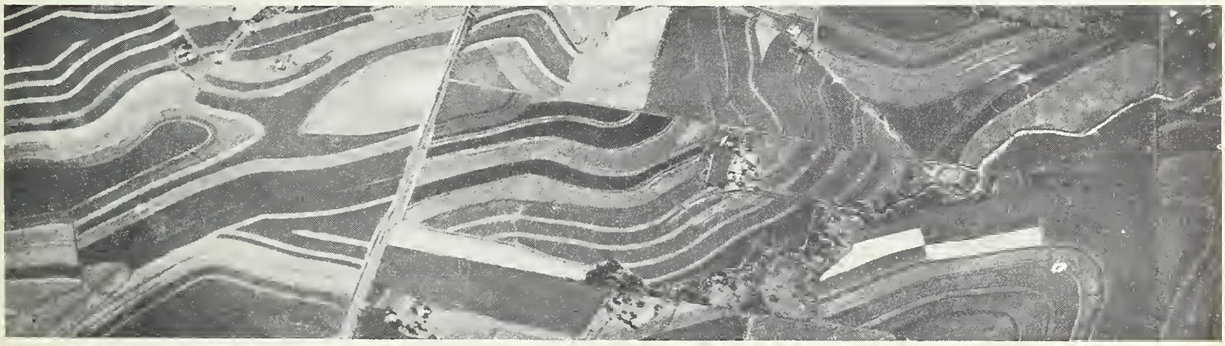
The gouging of a stream bank, the cutting of a gully, may be caused by abuse of the land half a mile back up the watershed.

# FARMERS VOTE FOR COOPERATION

To create a solid front against soil erosion, farmers are forming soil conservation districts, now authorized by special laws in most States. More than 300,000,000 acres of land have been organized into soil conservation districts since 1937.



Local, democratically organized bodies, these districts can pool local resources for soil conservation work and get further help from the State and Federal Governments. Districts are usually governed by locally elected boards of supervisors who draw up their programs of land improvement and get help from other public agencies in making surveys, helping farmers learn and apply conservation practices, in improving forests, controlling floods, and other related activities.



Soil conservation districts are usually organized to include entire watersheds, so that soil erosion may be effectively and completely controlled on all lands.

# CONSERVATION PATTERNS

Slowing down the run-off of rain water and keeping strong vegetative cover on the land are the two fundamentals of soil conservation. To achieve these two objectives, the use of every acre of land must be re-examined. Soil conservation is not complete until safe and practical measures have been applied to all lands within the boundaries of the farm.

By comparing the map on the opposite page with that inside the front cover, you can see the improved methods of using the land that make up a conservation program. Contour farming, with the rows and fence lines curving around the hills, has replaced the former square-farming pattern.

① STRIP CROPPING checks sheet erosion on the gentler slopes.

② MEADOW STRIPS, or vegetated waterways, replace former gullies.

③ TERRACES and diversion ditches lead surplus water safely off the fields.

④ CROP ROTATIONS in contour strips maintain soil fertility and help prevent erosion.

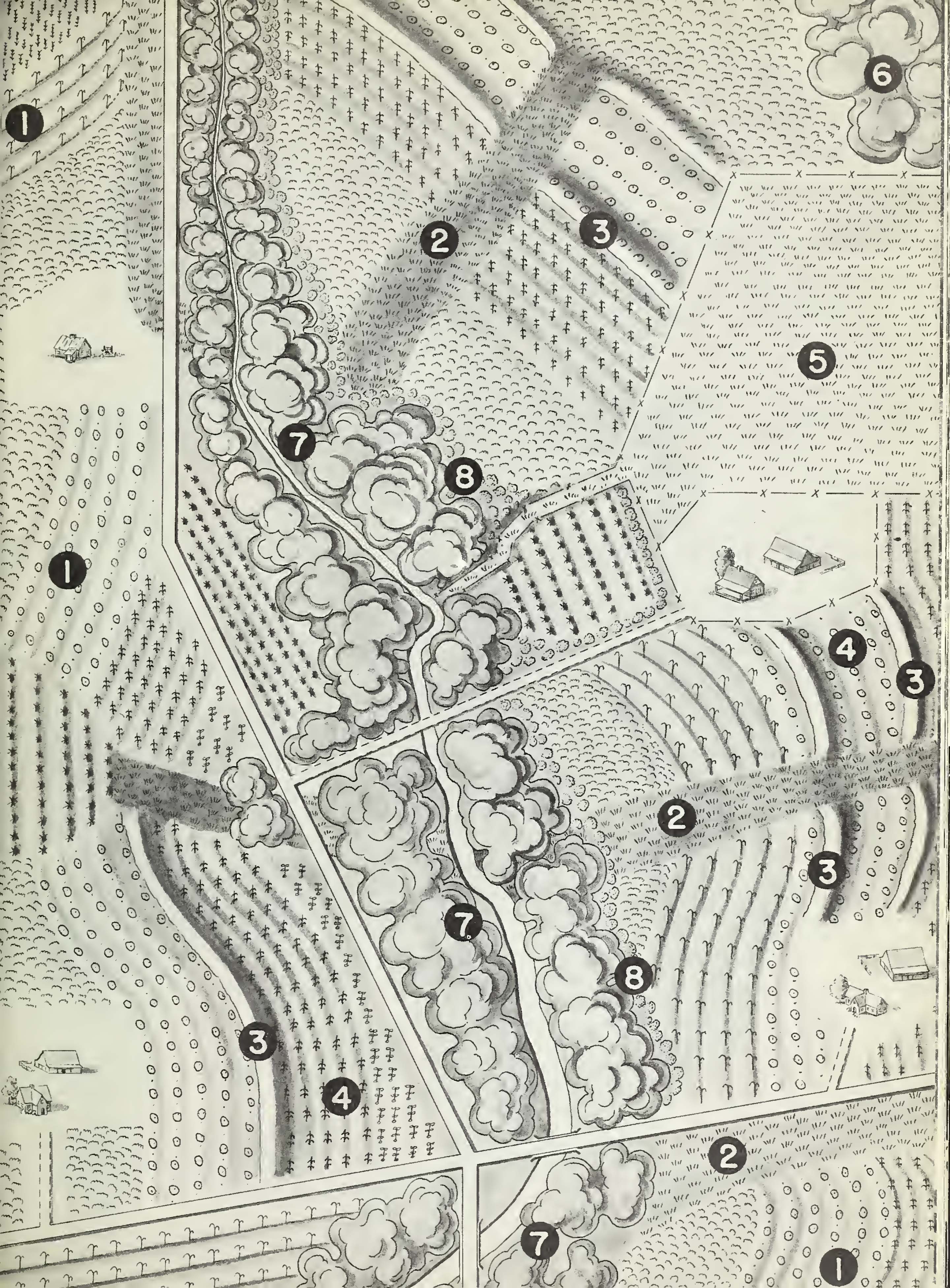
⑤ IMPROVED PASTURES carpet the soil with binding grasses.

⑥ PROTECTED WOODLANDS hold the soil on steep slopes and put wet bottom land to use.

⑦ STREAM-BANK IMPROVEMENT and the control of run-off on sloping fields minimize flood dangers.

⑧ BORDER STRIPS of shrubs and grasses along the fence lines feed and shelter wildlife.

Soil conservation is more than a process of saving the fertility of the farmer's fields. Its patterns suggest a world of natural harmony—a balance between the forces of destruction and creation that through millions of years have shaped a verdant landscape on a globe of lifeless rock. Only in harmony with those forces can man continue to live.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# THE SOIL CONSERVATION PROGRAM

Half of the land area of the United States is being attacked by soil erosion. Already approximately 282,000,000 acres of once good agricultural land has been seriously damaged—much of it completely ruined for cultivation. On an additional 775,000,000 acres of land that is still being used for crop cultivation or grazing, erosion is proceeding at an increasingly rapid rate.

American farmers every year suffer direct losses as a result of soil erosion that are valued at 400 million dollars. Further costs to the Nation, aggregating many millions of dollars, are imposed by damage to highways and railroads, and by silting of rivers, harbors, and reservoirs, caused by soil erosion.

The Soil Conservation Service, of the United States Department of Agriculture, was established under the Soil Conservation Act of 1935 to take the lead in stopping the destructive waste of soil and water. Through the cooperation of farmers and of public agencies representing both Federal and State Governments, the foundations are being laid for a better guardianship of the land resources of this Nation and the protection of the soil fertility.

Through its research program the Soil Conservation Service is developing and constantly improving the techniques of conserving soil and water. In every important agricultural region, the Service has provided practical demonstrations of how modern farming methods may be adapted to the purposes of soil conservation.

Finally, by working with organized groups of farmers and others directly concerned with agricultural enterprise, the Service is giving necessary technical assistance to land operators who wish to apply the results of research and demonstration to their own farms and ranches. Most of this assistance is now being given to soil conservation districts—local agencies organized by farmers under authority of special State laws.

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